

CLAIMS

1. A magnetic head for writing information on a relatively-moving medium, the head having a leading end, a trailing end and a medium-facing surface, the head comprising:

a first soft magnetic pole layer disposed in the head adjacent to the medium-facing surface and extending substantially perpendicular to the medium-facing surface;

a second soft magnetic pole layer disposed closer than the first pole layer to the trailing end, the second pole layer magnetically coupled to the first pole layer in a backgap region that is removed from the medium-facing surface;

a soft magnetic pedestal adjoining the second pole layer, the pedestal disposed closer than the second pole layer to the medium-facing surface and extending less than the second pole layer extends from the medium-facing surface, the pedestal separated from the first pole layer by a nonferromagnetic gap, the pedestal having a thickness that is less than four hundred and fifty nanometers between the gap and the second pole layer; and

a conductive section that is disposed between and electrically isolated from the first and second pole layers.

2. The head of claim 1, wherein the conductive section is part of a coil that substantially encircles the second pole layer.

3. The head of claim 2, wherein the conductive section is ferromagnetic.

4. The head of claim 1, wherein the conductive section is part of a coil that substantially encircles the backgap region.

5. The head of claim 1, wherein the conductive section is part of a coil that includes less than seven conductive sections disposed between and electrically isolated from the first and second pole layers.

6. The head of claim 1, wherein the second pole layer has a leading surface and a trailing surface, the trailing surface having a flat area disposed approximately midway between the medium-facing surface and the backgap region, the leading surface having a curved area disposed closest to the flat area.
7. The head of claim 1, wherein the second pole layer has a trailing surface that is disposed distal to the first pole layer, the trailing surface having a plurality of curved sections separated by a flat, polished section.
8. The head of claim 1, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and each terminating in a conductive portion that is disposed in the layer and extends transversely to the conductive sections.
9. The head of claim 1, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and having a different length measured in a direction parallel to the medium-facing surface.
10. The head of claim 1, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, and an inorganic nonmagnetic insulating material is disposed between the conductive sections.
11. The head of claim 1, wherein the second pedestal includes a high magnetic saturation material.

12. The head of claim 1, wherein the second pedestal is separated from the first pole layer by less than one hundred nanometers.
13. The head of claim 1, wherein the second pedestal is separated from the first pole layer by at least one micron.

14. A magnetic head for writing information on a relatively-moving medium, the head having a leading end, a trailing end and a medium-facing surface, the head comprising:

a first soft magnetic pole layer disposed in the head adjacent to the medium-facing surface and extending substantially perpendicular to the medium-facing surface;

a second soft magnetic pole layer disposed closer than the first pole layer to the trailing end, the second pole layer magnetically coupled to the first pole layer in a backgap region that is removed from the medium-facing surface;

a first soft magnetic pedestal adjoining the first pole layer, the first pedestal including a region that extends less than the first pole layer extends from the medium-facing surface;

a second soft magnetic pedestal adjoining the second pole layer, the second pedestal disposed closer than the second pole layer to the medium-facing surface and extending less than the second pole layer extends from the medium-facing surface, the second pedestal separated from the first pedestal by a nanoscale nonferromagnetic gap, the second pedestal and the first pedestal having track widths that are substantially aligned for a distance that is less than nine hundred nanometers; and

a conductive section that is disposed between and electrically isolated from the first and second pole layers.

15. The head of claim 1, wherein the conductive section is part of a coil that substantially encircles the second pole layer.

16. The head of claim 15, wherein the conductive section is ferromagnetic.

17. The head of claim 15, wherein the conductive section is part of a coil that substantially encircles the backgap region.

18. The head of claim 15, wherein the conductive section is part of a coil that includes less than seven conductive sections disposed between and electrically isolated from the first and second pole layers.
19. The head of claim 15, wherein the second pole layer has a leading surface and a trailing surface, the trailing surface having a flat area disposed approximately midway between the medium-facing surface and the backgap region, the leading surface having a curved area disposed closest to the flat area.
20. The head of claim 15, wherein the second pole layer has a trailing surface that is disposed distal to the first pole layer, the trailing surface having a plurality of curved sections separated by a flat, polished section.
21. The head of claim 15, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and each terminating in a conductive portion that is disposed in the layer and extends transversely to the conductive sections.
22. The head of claim 15, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and having a different length measured in a direction parallel to the medium-facing surface.
23. The head of claim 15, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, and an inorganic nonmagnetic insulating material is disposed between the conductive sections.

24. The head of claim 15, wherein the first and second pedestals include a high magnetic saturation material.

25. A magnetic head for writing information on a relatively-moving medium, the head having a leading end, a trailing end and a medium-facing surface, the head comprising:

a first soft magnetic pole layer disposed in the head adjacent to the medium-facing surface and terminating adjacent to the medium-facing surface in a return pole tip;

a second soft magnetic pole layer disposed closer than the first pole layer to the trailing end, the second pole layer magnetically coupled to the first pole layer in a backgap region that is removed from the medium-facing surface;

a soft magnetic pedestal adjoining the second pole layer, the pedestal disposed closer than the second pole layer to the medium-facing surface and extending less than the second pole layer extends from the medium-facing surface, the pedestal terminating adjacent to the medium-facing surface in a write pole tip that is at least two orders of magnitude smaller than the return pole tip, the pedestal having a thickness that is less than two hundred and fifty nanometers between the gap and the second pole layer; and

a conductive section that is disposed between and electrically isolated from the first and second pole layers.

26. The head of claim 25, wherein the conductive section is part of a coil that substantially encircles the second pole layer.

27. The head of claim 25, wherein the conductive section is part of a coil that substantially encircles the backgap region.

28. The head of claim 25, wherein the conductive section is part of a coil that includes less than seven conductive sections disposed between and electrically isolated from the first and second pole layers.

29. The head of claim 25, wherein the second pole layer has a leading surface and a trailing surface, the trailing surface having a flat area disposed approximately midway

between the medium-facing surface and the backgap region, the leading surface having a curved area disposed closest to the flat area.

30. The head of claim 25, wherein the second pole layer has a trailing surface that is disposed distal to the first pole layer, the trailing surface having a plurality of curved sections separated by a flat, polished section.

31. The head of claim 25, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and each terminating in a conductive portion that is disposed in the layer and extends transversely to the conductive sections.

32. The head of claim 25, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, the conductive sections disposed in a layer, extending parallel to each other, and having a different length measured in a direction parallel to the medium-facing surface.

33. The head of claim 25, wherein the conductive section is part of a coil that includes a plurality of conductive sections that are disposed between and electrically isolated from the first and second pole layers, and an inorganic nonmagnetic insulating material is disposed between the conductive sections.

34. The head of claim 25, wherein the pedestal includes a high magnetic saturation material.

35. The head of claim 25, wherein the write pole tip is separated from the return pole tip by a nonferromagnetic gap of at least one micron.